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Segmentation on Panoramic Dental X- Ray Images Using U-Net

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Abstract: *Radiological examinations in dentistry help professionals by targeting teeth for dental implants, bone defects, cysts, abscesses, infections, tumors, problems in the temporomandibular regions, to name a few some names, the skeletal system indicated. Although there is not yet a need for fully automated diagnostic tools, image pattern recognition has progressed towards decision support, primarily from the identification of teeth and their contents in X-ray images. Following a new direction, this paper proposes the investigation of a deep learning technique, such as tooth segmentation. To our knowledge, this is the first system to recognize and classify each tooth in panoramic X- ray images. It should be noted that this image is the most robust for dental separation because it shows other parts of the patient's body (e.g. mandible, pelvis, and jaw) We propose a classification system based on a mask area-based complex neural networks so do not pattern classification. Performance was evaluated from 1500 robust image datasets, which had high diversity and included 10 groups of different buccal images The proposed ancient system used only 193 facial images with an average of 1500 images. there are 32 teeth, using the transfer learning methods, we obtained 98% accuracy, 88 % F1-score, 94% accuracy; More than 1224 unrecognized images achieved 84% recall and 99% specificity, better results than the other 10 unsupervised methods*

Keywords: Radiological examinations